

What Is Claimed Is:

1. A method for loading a solute into a cell comprising:
disposing a cell in a solution having a solute concentration having a temperature of at least 25° C and of sufficient magnitude to produce hyperosmotic pressure on the cell for transferring a solute from the solution into the cell.
2. The method of Claim 1 wherein said solute concentration includes an extracellular cellular solute concentration for elevating extracellular osmolarity within the solution to a value which is greater than a value of the intracellular osmolarity of the cell.
3. The method of Claim 1 wherein said transferring a solute is by fluid phase endocytosis.
4. The method of Claim 1 wherein said solute comprises trehalose and said cell comprises an erythrocytic cell.
5. The method of Claim 4 wherein said transferring of trehalose from the solution into the erythrocytic cell is without degradation of the trehalose.
6. The method of Claim 4 wherein a gradient of trehalose concentration within the erythrocytic cell to extracellular trehalose concentration within the solution ranges from about 0.130 to about 0.200.

7. The method of Claim 4 wherein said solute solution has a trehalose concentration ranging from about 320 mM to about 4000 mM.

8. The method of Claim 1 additionally comprising

preventing a decrease in a loading efficiency gradient in the loading of the solute into the cell.

9. The method of Claim 8 wherein said solute comprises an oligosaccharide and said preventing a decrease in a loading efficiency gradient in the loading of the oligosaccharide into the cell comprises maintaining a concentration of the oligosaccharide in the oligosaccharide solution below a concentration ranging from about 35 mM to about 65 mM.

10. The method of Claim 8 wherein said solute comprises an oligosaccharide and said preventing a decrease in a loading efficiency gradient in the loading of the oligosaccharide into the cell comprises maintaining a positive gradient of loading efficiency to concentration of the oligosaccharide in the oligosaccharide solution.

11. A cell produced in accordance with the method of Claim 1.

12. A method for loading trehalose into an erythrocytic cell comprising disposing an erythrocytic cell in a trehalose solution having a temperature of at least 25° C and a trehalose concentration of at least about 25 % greater than the intracellular osmolarity of the erythrocytic cell for loading the trehalose into the erythrocytic cell.

13. The method of Claim 12 wherein said loading the trehalose into the erythrocytic cell is by fluid phase endocytosis.
14. The method of Claim 12 wherein said loading of the trehalose from the trehalose solution into the erythrocytic cell is without degradation of the trehalose.
15. The method of Claim 12 said loading of the trehalose produces a loaded erythrocytic cell having a gradient of loaded trehalose concentration within the erythrocytic cell to extracellular trehalose concentration within the trehalose solution ranging from about 0.130 to about 0.200.
16. The method of Claim 12 wherein said trehalose solution has a trehalose concentration ranging from about 25 % to at least about 1000% greater than the intracellular osmolarity of the erythrocytic cell.
17. An erythrocytic cell produced in accordance with the method of Claim 12.
18. A method for preparing a dehydrated composition comprising:
loading cells in a loading solution having a salt solution and a solute for producing loaded cells; and
lyophilizing the loaded cells in a freeze-drying solution having a drying salt solution, the solute, an inert substance and a protein to produce a dehydrated composition.
19. The method of Claim 18 wherein said loading solution comprises at least about 200 mM of the solute and at least about 75 mOsm of the salt solution.

20. The method of Claim 19 wherein said freeze-drying solution comprises at least about 50 mM of the solute; at least about 2.0 % by weight of the inert substance; at least about 0.5 % by weight of the protein, and at least about 25 mOsm for an osmolarity of the salt solution.
21. A method for reducing hemolysis in treating cells comprising loading cells in an incubation period with a loading solution comprising a salt solution and at least about 200 mM of a solute to reduce hemolysis of the cells to less than about 10 %.
22. The method of Claim 21 wherein said loading solution additionally comprises a starch and a protein, and said hemolysis of the cells is reduced to less than about 5 %.
23. The method of Claim 21 additionally comprising washing the loaded cells, and drying washed cells within 2 hours after washing to assist in maintaining hemolysis below about 10 %.
24. A method for stabilizing cells comprising loading cells in a loading solution to produce cells having an effective amount of a solute for possessing a mean corpuscular hemoglobin (pg) greater than about 10.
25. The method of Claim 24 wherein said mean corpuscular hemoglobin (pg) is greater than about 14.
26. The method of Claim 24 wherein said effective amount of a solute is greater than about 50 mM.
27. A method for reconstituting dried cells comprising

drying solute-loaded cells in a drying solution having a salt solution, a solute, an inert substance, and a protein to produce dried cells; and

reconstituting the dried cells in a rehydration solution having the salt solution, the solute, the inert substance, and the protein to produce reconstituted cells.

28. The method of Claim 27 wherein said drying solution comprises at least about 50 mM of the solute; at least about 25 mOsm osmolarity of the salt solution; at least about 2.0 % by weight of the inert substance; and at least about 0.5 % by weight of the protein.

29. The method of Claim 28 wherein said rehydration solution comprises at least about 50 mM of the solute; at least about 25 mOsm osmolarity of the salt solution; at least about 2.0 % by weight of the inert substance; and at least about 0.5 % by weight of the protein.

30. The method of Claim 27 wherein said dried cells comprise from about 25 mM to about 300 mM of the solute; from about 5 mOsm to about 100 mOsm osmolarity for the salt solution; from about 0.1 % by weight to about 2.5 % by weight of the protein; and from about 1.0 % by weight to about 15.0 % by weight of the inert substance.

31. The method of Claim 30 wherein solute comprises trehalose, said salt solution comprises PBS, said protein comprises albumin, and said inert substance comprises a starch.

32. The method of Claim 31 wherein said dried cells comprise from about 60 mM to about 80 mM trehalose, from about 10 mOsm to about 40 mOsm PBS, from about 0.3 % by weight to about 9.0 % by weight albumin, and about 1.0 % by weight to about 4.0 % by weight starch.

33. The method of Claim 21 additionally comprising adding an inert substance and/or a protein to the loading solution to further reduce hemolysis.